WHAT IS CLAIMED IS:

1. A method comprising:

generating alignment light to align a wafer with an imaging plate of an optical system;

modifying the alignment light using an alignment grating on the imaging plate, the alignment grating having a first pitch; and

further modifying the alignment light at a pupil plane of the optical system to have an intensity periodicity of less than the first pitch at a wafer plane.

2. The method of claim 1, wherein the intensity periodicity of the alignment light at the wafer plane is equal to half the first pitch.

3. The method of claim 1, wherein modifying the alignment light using an alignment grating comprises transmitting light through the alignment grating.

4. The method of claim 1, wherein modifying the alignment light using an alignment grating comprises reflecting light from the alignment grating.

5. The method of claim 1, further comprising:

reflecting a reflected portion of the alignment light from an alignment pattern on a wafer at the wafer plane, the alignment pattern having a second pitch less than the first pitch.

6. The method of claim 5, wherein the second pitch is half the first pitch.

7. The method of claim 5, further comprising:

receiving at least a portion of the reflected portion of the light in a detector; and

determining an alignment characteristic based on the receiving.

8. The method of claim 7, further comprising changing the position of the wafer based on the alignment characteristic.

9. The method of claim 7, further comprising determining an alignment position based on the alignment characteristic.

10. The method of claim 9, wherein changing the position of the wafer based on the alignment characteristic comprises positioning the wafer at the alignment position.

11. The method of claim 1, wherein further modifying the alignment light at the pupil plane comprises:

blocking a central maximum of the alignment light at the pupil plane; and

allowing unblocked light including a first order maximum of the alignment light to pass at the pupil plane.

12. The method of claim 11, wherein the blocking comprises blocking using a pupil filter in the pupil plane, and wherein the method further comprises moving the pupil filter to a position not in a light path between the imaging plate and the wafer.

13. The method of claim 12, further comprising:

generating patterning light to pattern one or more devices on the wafer;

modifying the patterning light using a device pattern on the imaging plate; and

exposing a portion of a resist layer on the wafer using the patterning light.

14. The method of claim 13, wherein modifying the alignment light using an alignment grating comprises transmitting light of an alignment wavelength through the alignment grating, and wherein modifying the patterning light using a device pattern comprises subsequently transmitting light of a different exposure wavelength through the device pattern.

15. The method of claim 14, wherein the different exposure wavelength is substantially smaller than the alignment wavelength.

16. A lithography system comprising:

an imaging plate holder having mounting features shaped and configured to position an imaging plate including an alignment grating with respect to a wafer plane, wherein the alignment grating has a pitch P;

a pupil filter positioned in a pupil plane of the optical system, the pupil filter to receive a portion of alignment light modified by the alignment grating and to further modify the alignment light to have an intensity periodicity less than P at the wafer plane; and

a wafer stage having mounting features shaped and configured to position a wafer in the wafer plane to receive the further modified alignment light and to reflect a reflected portion of the further modified alignment light.

17. The system of claim 16, wherein the pupil filter is to further modify the alignment light to have an intensity periodicity of P/2 at the wafer plane.

18. The system of claim 16, wherein the pupil filter is a central obscuration sized and shaped to block a zero-th order maximum of the alignment light modified by the alignment grating, the central obscuration further sized and shaped to allow a first order maximum of the alignment light modified by the alignment grating to pass.

19. The system of claim 16, wherein the mounting features of the wafer stage comprise a vacuum chuck configured to position a wafer in the wafer plane.

20. The system of claim 16, wherein the mounting features of the wafer stage comprise an electrostatic chuck configured to position a wafer in the wafer plane.

21. The system of claim 16, wherein the imaging plate holder having mounting features shaped and configured to position an imaging plate is a reticle holder, and wherein the system further includes a reticle mounted in the reticle holder.

22. The system of claim 16, further comprising a wafer mounted in the wafer stage.

23. The system of claim 16, further including a detector positioned to receive at least some of the reflected portion.

24. The system of claim 16, wherein the pupil filter is removably mounted in the optical system.

25. The system of claim 16, wherein the lithography system is a visible light lithography system.

26. The system of claim 16, wherein the lithography system is an ultraviolet light lithography system.

27. The system of claim 16, wherein the lithography system is an extreme ultraviolet lithography system.

28. A lithography alignment system, comprising:

an optical system having a numerical aperture of NA, the optical system comprising:

an imaging plate including an alignment grating with a pitch P, the pitch P about equal to or greater than λ/NA, where λ is a wavelength of alignment light to be used, the alignment grating positioned to receive alignment light and to modify at least a portion of the alignment light;

a pupil filter positioned in a pupil plane of the optical system, the pupil filter to receive at least a portion of the alignment light modified by the grating and to further modify the alignment light to have an intensity periodicity I less than P at a wafer plane; and

a wafer having an alignment pattern with a pitch equal to I, the wafer positioned in the wafer plane to receive at least a portion of the alignment light further modified by the pupil filter and to reflect a reflected portion of the alignment light.

29. The system of claim 28, wherein I is equal to P/2.

30. The system of claim 28, wherein the pupil filter is a central obscuration sized and shaped to block a zero-th order maximum of the alignment light modified by the grating, the central obscuration further sized and shaped to allow a first order maximum of the alignment light modified by the grating to pass.

31. The system of claim 28, wherein I is substantially equal to $\lambda/2NA$.

32. The system of claim 28, wherein I is between about $\lambda/2NA$ and about 0.9 λ/NA.

33. The system of claim 28, where λ is chosen from the group consisting of 533 nm and 632 nm.

34. The system of claim 28, wherein the wafer is positioned on a wafer stage, the wafer stage to translate the wafer in the wafer plane.

35. The system of claim 28, wherein the imaging plate is chosen from the group consisting of a mask and a reticle.

36. The system of claim 28, wherein the optical system further comprises a lens positioned between the imaging plate and the pupil plane.

37. The system of claim 28, wherein the optical system further comprises another lens positioned between the pupil plane and the wafer.

38. The system of claim 28, further including a detector positioned to receive at least some of the reflected portion.

39. The system of claim 38, wherein the detector is to provide a detector output related to a characteristic of the at least some of the reflected portion, and further comprising a data processing system to receive the detector output.

40. The system of claim 39, wherein the characteristic is an intensity.

41. The system of claim 39, wherein the characteristic is an interference pattern.

42. The system of claim 39, wherein the wafer is positioned on a wafer stage, the wafer stage to translate the

wafer in the wafer plane, and wherein the wafer stage is to provide a wafer stage output related to a position of the wafer stage, and wherein the data processing system is to receive the wafer stage output.

43. The system of claim 42, wherein the data processing system is to correlate the detector output and the wafer stage output.

44. The system of claim 43, wherein the data processing system is to determine an alignment position based on the correlation.

45. The system of claim 38, further including a mirror to direct the at least some of the reflected portion toward the detector.

46. The system of claim 28, further including a light source to produce light having a wavelength λ.